

Remarks

Amendments

Claims 1 and 10 have been amended to insert language regarding the S and D material portions of the amphipathic copolymer. Antecedent basis for this amendment is located in the specification at page 11, lines 20-23. Claims 1 and 10 additionally have been amended to add the requirement that the amphipathic copolymer has a total calculated T_g greater than or equal to about 30°C. This claim limitation clearly establishes that the toner compositions as claimed are suitable for electrophotographic processes wherein the transfer of the image from the surface of a photoconductor to an intermediate transfer material or directly to a print medium is carried out without film formation on the photoconductor. Antecedent basis for this amendment is located throughout the specification, and particularly in originally presented claim 4, which has now been cancelled.

The specification has been amended to specifically recite intended terminology for the “visual enhancement additive.” This term has been frequently used in the prior art (see, e.g. Baker 6,255,363 and Li 5,886,067), and additionally was fully defined in patent application Serial No 10/612,534 at page 33, line 12 to page 34, line 8. This recitation was inadvertently left out of the present specification. Patent application Serial No 10/612,534 was incorporated by reference in the present application at page 24, lines 15-21. This definition is therefore properly entered in the present specification and does not introduce new matter.

It is respectfully submitted that no new matter is introduced by these amendments.

Objections to the specification

The Office Action states that the pending applications should be updated. This has been accomplished by the present amendment.

The Office Action additionally states that trademarks should be capitalized. In review of the specification, it would appear that trademark usage is proper in this application. Specifically, the terms used on page 15 are capitalized, and additionally identified as trademarks by the TM symbol. It is therefore respectfully submitted that their usage is proper in the present application.

Claim Rejections

Claims 1, 2 and 4-6 have been rejected under 35 USC 112, second paragraph as being indefinite.

More specifically, claim 1 has been stated to be indefinite in the terms S and D. This claim has been amended to relate these terms to the carrier liquid.

Claim 2 has been stated to be indefinite in the term “visual enhancement additive,” stating that the only type is a pigment particle. It is respectfully submitted that the full scope of this term would be understood to include more than a pigment particle, and that this understanding is clarified by the amendment to the specification.

Claims 4-6 have been objected to as teaching a range of T_g , while the specification at page 21 is noted as stating a T_g of at least 55°. It is respectfully noted that claims 4-6 relate to the T_g of the entire amphipathic copolymer, and the discussion at page 21 relates only to the T_g of a single monomer component of the D material portion of the copolymer. Thus, these two T_g requirements are not in conflict because the T_g of 55° as described in the specification relates only to a component of the entire copolymer, which may have a calculated T_g as determined by the Fox equation that is lower or higher than any single component.

Claims 1-12 have been rejected under 35 USC 103 as being unpatentable over Baker 6,649,316 in view of Elmasry 4,978,598 and Jongewaard 4,988,602.

The present claims relate to liquid electrophotographic toner composition having toner particles dispersed in a liquid carrier having a Kauri-butanol number less than 30 mL. The toner particles comprise polymeric binder comprising at least one amphipathic copolymer comprising one or more S material portions and one or more D material

portions. The D material portion of the toner particles has a T_g greater than about 55°C. Further, the claims have been amended to specifically recite that the amphipathic copolymer has a total calculated T_g greater than or equal to about 30°C. This claim limitation clearly establishes that the toner compositions as claimed are suitable for electrophotographic processes wherein the transfer of the image from the surface of a photoconductor to an intermediate transfer material or directly to a print medium is carried out without film formation on the photoconductor.

The toners as described herein, through the selection of T_g s of components in the D material portion and additionally in the T_g of the total amphipathic copolymer, surprisingly provide compositions that are particularly suitable for electrophotographic processes wherein the transfer of the image from the surface of a photoconductor to an intermediate transfer material or directly to a print medium is carried out without film formation on the photoconductor. The claimed toner compositions exhibit exceptional storage stability, excellent image transfer, and superior final image properties relative to erasure resistance and blocking resistance. Images made using the compositions of the present invention are surprisingly non-tacky and are resistant to marring and undesired erasure.

Baker 6,649,316 describes a phase change developer comprising: (a) a carrier having a Kauri-butanol number less than 30; and (b) an organosol comprising a graft (co)polymeric steric stabilizer covalently bonded to a thermoplastic (co)polymeric core that is insoluble in said carrier, and said (co)polymeric steric stabilizer comprises a crystallizing polymeric moiety that independently and reversibly crystallizes at or above 30°C, wherein said phase change developer has a melting point at or above 22°C.

As noted in the Baker '316 specification beginning at column 11, line 52, the term "phase change developer" has an accepted meaning within the imaging art. As the term indicates, the developer system is present as one physical phase under storage conditions (e.g., usually a solid) and transitions into another phase during development (usually a liquid phase), usually under the influence of heat or other directed energy sources. Thus, in the system as described in Baker '316, the toner is converted from a solid form to a liquid form prior to development, so that the toner as described first is in the solid form, and then through a specific manipulation is converted to liquid form under image

formation conditions so that the actual image formation process is carried out in the form of a liquid. See column 2, lines 21-25. Baker '316 therefore does not teach or suggest a liquid toner as presently claimed.

Additionally, Baker '316 describes a toner system wherein the toner is designed to form an image on the surface of a photoconductor with film formation on the photoconductor, which formed film is then transferred to an intermediate transfer material or directly to a print medium. See, e.g. Column 14, lines 64-65, which describes the drying of the film on the photoconductive element surface. Thus, the Baker '316 patent would require in operation that the copolymer have a T_g low enough to form a film on the photoreceptor, i.e. below the presently required T_g of greater than or equal to about 30°C.

Elmasry 4,978,598 describes liquid toners for developing electrophotographic images containing dispersed toner particles that are based on a polymer with multi-characteristics. These particles comprise a thermoplastic resinous core with a T_g below room temperature, which is chemically anchored to an amphipathic copolymer steric stabilizer containing covalently attached groups of a coordinating compound which in turn are capable of forming covalent links with organo-metallic charge directing compounds. As noted in the outstanding Office Action, the Elmasry disclosure notes that the core T_g can be from 25-105°C, provided that the toner can be coalesced at room temperature. This reference, thus describes a toner system wherein the toner is designed in all embodiments to form an image on the surface of a photoconductor by forming a film on the photoconductor, which formed film is then transferred to an intermediate transfer material or directly to a print medium. See column 25, lines 30-39. This reference thus does not add teaching to the Baker '316 reference that would suggest to the skilled artisan the invention of the present claims.

Jongewaard 4,988,602 describes liquid toners for developing electrophotographic images that contain dispersed toner particles that are based on a polymer with multi-characteristics. The particles described therein comprise a thermoplastic resinous core with a T_g below room temperature, which is chemically anchored to an amphipathic copolymer steric stabilizer containing covalently attached groups of a coordinating

compound which in turn are capable of forming covalent links with organo-metallic charge directing compounds and a thermoplastic ester resin that functions as a charge enhancing component for the toner. The toners as described in this reference are specifically designed to film form on the photoreceptor so that overprinting with sequential colors can be carried out prior to transfer of the film to the receptor sheet. See column 7, lines 35-37 and column 14, line 56 to column 15, line 3.

The skilled artisan would have had no motivation to prepare a toner composition of the present claims, which surprisingly provide compositions through the selection of the T_g of components in the D material portion and additionally of the T_g of the total amphipathic copolymer that are particularly suitable for electrophotographic processes wherein the transfer of the image from the surface of a photoconductor to an intermediate transfer material or directly to a print medium is carried out without film formation on the photoconductor. Furthermore, the skilled artisan could not have expected that such toner compositions would exhibit exceptional storage stability, excellent image transfer, and superior final image properties relative to erasure resistance and blocking resistance. Additionally, one would not have predicted that images made using the compositions as presently claimed would be surprisingly non-tacky and resistant to marring and undesired erasure.

Claim Rejections – Double Patenting

Claims 1-12 have been provisionally rejected under the judicially created doctrine of obviousness-type double patenting over claims 1-24 of copending Application No. 10/612533 in view of Baker.

In order to overcome this provisional rejection and to expedite prosecution, a terminal disclaimer in view of copending Application No. 10/612533 is enclosed without prejudice.

Conclusion

In view of the above remarks, it is respectfully submitted that the foregoing is fully responsive to the outstanding Office action. In the event that a phone conference between the Examiner and the Applicant's undersigned attorney would help resolve any issues in the application, the Examiner is invited to contact said attorney at (651) 275-9811.

Date: May 5, 2005

Respectfully Submitted,

By: 

Dale A. Bjorkman, Reg. No. 33,084

Customer No. 33072

Phone: 651-275-9811

Fax: 651-351-2954